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Hydrodynamic Instability Modeling on Ignition ICF Capsules

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We describe modeling that has been used to design targets for the National Ignition Facility and to set surface finish specifications for them. The perturbations are weakly nonlinear, because of ablation stabilization, and the approach emphasizes code simulations of relatively long wavelength perturbations (mode number less than ~100, with most important effects at ~20). We will discuss results of single mode simulations, of multimode simulations, and of modeling that combines single mode simulations with nonlinear saturation modeling. Combined modeling assumes the existence of initial perturbations on all surfaces, and of radiation asymmetry as determined from integrated calculations. Nonlinear effects are quantitatively important but do not qualitatively change the evolution of the perturbations.

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